Math 307 Quiz 7

June 4, 2014

Problem 1. For each of the following, determine the correct form of the partial fraction decomposition

Example The form of the PFD of $\frac{3s+4}{(s-1)^2}$ is $\frac{A}{s-1} + \frac{B}{(s-1)^2}$

(a) $\frac{2s+3}{s^2+2s+1}$

(b) $\frac{s^3+3s^2+4s+5}{(s-2)^2(s-3)}$

(c) $\frac{s^2+17s+43}{s(s^2+1)^2(s-4)^2(s-5)}$

(d) $\frac{s^2+3s+2}{(s-1)(s+4)}$

Problem 2.

(a) State the definition of the Laplace trasform $F(s) = \mathcal{L}(f(t))$.

(b) Give an example of a function whose Laplace transform does not exist, and explain why.

(c) Determine the Laplace transform $F(s)$ of

$$f(t) = te^{2t}\cos(t)$$

using only the basic definition of the Laplace transform.

Problem 3. Determine the inverse Laplace transform of

$$F(s) = \frac{2s+3}{s^2+4s+1}$$

Problem 4. Determine the inverse Laplace transform of

$$F(s) = \frac{s-5}{s^2-s-6}$$